

REMARKS

The examiner withdrew the rejection of Claims 1-10, 12, 15, 51-55, 59-68, 83-85, 87 and 89 under 35 U.S.C. 102(e) as being anticipated by Johnson (US Patent 6,955,187).

103(a) Rejection

The examiner has now rejected Claims 1-13, 15, 51-55, 59-68, 83-85, 87 and 89 under 35 U.S.C. 103(a) as being obvious over Johnson (US Patent 6,955,187) in view of Brotz (US Patent 5,588,295).

In rejection of applicant's claims, it appears that the examiner does not use Brotz until the rejection of claim 11.

Nonetheless, Applicant's claim 1 is neither described nor suggested by Johnson taken separately or in combination with Brotz, since Johnson in combination with Brotz neither describes nor suggests a mechanism ... comprising a member whose shape deforms in response to a current drawn from the battery ... the member has a first shape that allows air to pass through the opening in the first member ... and the member has a second shape ... to ... inhibit air from passing through the opening and into the battery.

In rejection of claim 1, the examiner stated:

Regarding claims 1-3, 51-53 and 59-61, Johnson teaches a battery having a control valve for controlling airflow into the battery. The control portion is made of two cylindrical sleeves, or members, having holes, that can be moved into or out of registration depending on whether air is required for the cell. The movement is controlled by actuators that are attached to the cylinders (abstract; Figure 1; column 3 lines 9-11). Further, Johnson teaches that the current required to induce a shape change in the actuators is generated by electricity from the electrochemical cell (column 4 lines 15-17).

Claim 1 is neither described nor suggested by Johnson. Specifically, Johnson discloses two actuator members whose lengths change to open and close the air valve. In contrast, Applicant provides "... a member whose shape deforms ..., the member ... coupled to one of the first and second members to move the one ... such that when current is drawn from the battery, the member has a first shape that allows air to pass ... and the member has a second shape that causes the one ... to move and inhibit air from passing through the opening."

The examiner notes that: "Johnson teaches ... The movement is controlled by actuators that are attached to the cylinders (abstract; Figure 1; column 3 lines 9-11). Further, Johnson teaches that the current required to induce a shape change in the actuators is generated by electricity from the electrochemical cell (column 4 lines 15-17)."

However, these arguments are not directed to the claimed subject matter. For instance, the recognition by the examiner that Johnson teaches: "that the current required to induce a shape change in the actuators is generated by electricity from the electrochemical cell (column 4 lines 15-17).", is not correct. Johnson does not change the shape of the actuator but instead changes their lengths.

In contrast, Claim 1 calls for a member "whose shape deforms." However, claim 1 also requires that the member has a first shape that allows air to pass through the opening in the first member into the battery and the member has a second shape that causes the one of the first and second members to move and inhibit air from passing through the opening and into the battery.

In contrast, Johnson discloses the use of two wires 34, 36 that lengthen or contract, as oppose to change shape. In addition, both of the wires are required for operation of the valve. One wire is required to open the value disclosed by Johnson, whereas the other wire is required to close the valve disclosed by Johnson. According to Johnson, "Actuator mechanism 29 further comprises a bistable latch mechanism 94 which has a function of keeping the sleeves in either of their fully open or fully closed positions. The latch mechanism comprises a bistable element or beam 96 which operates in the manner of a buckling beam. The beam can be formed by an elastic material foil such as beryllium copper or steel. This beam is confined at its ends between two spaced supports 98."¹

What Johnson describes is a fundamentally different more complicated and expensive structure that has a substantially different principal of operation from that disclosed and claimed by Applicant.

The examiner does not offer any reasoning why one of ordinary skill in this art would be motivated to completely modify the valve mechanism disclosed by Johnson to provide a member whose shape controls when the valve is open and when the valve is closed.

¹ Johnson, col. 4, lines 55-61

Therefore, Johnson fails to describe or suggest "a mechanism, comprising a member whose shape deforms in response to a current drawn from the battery, ... the member has a first shape that allows air to pass through the opening ... and the member has a second shape ... to ... inhibit air from passing through the opening

Accordingly, the differences between the claimed mechanism and that disclosed by Johnson, precludes any suggestion to so modify Johnson and thus claim 1 is not obvious over Johnson. Therefore, claim 1 is allowable over Johnson.

Claims 2-7 are allowable at least for the reasons discussed in claim 1.

Claim 8 depends from claim 7 and serves to further distinguish since Johnson neither describes nor suggests that: "the actuator is coupled to a circuit and only draws power during a change of state allowing the circuit to minimize drain on the battery."

The examiner argues that: "Regarding claims 8, 66 and 84, Johnson teaches that when the valve is in the fully off position, no current flows from the cell to the wire actuator (column 5 lines 22-27)." However, this does not address the feature of claim 7, which requires that the actuator only draws power during a change of state.

Claim 9 depends from claim 6 and serves to further distinguish since Johnson neither describes nor suggests that: "the actuator is a wire with the wire changing between a convex and a concave shape to change the position of the second cylinder. Johnson neither describes nor suggests a wire or that the wire changes between a convex and a concave shape to change the position of the second cylinder.

In addressing claim 9, the examiner states: "As for claims 6, 9, 55, 64, 67, Johnson teaches that the actuators are made of wire shape memory alloys (column 3 lines 55-59)." Applicant contends that this argument is inadequate in that it does not address any of the specific features of claim 9, namely that "the actuator is a wire with the wire changing between a convex and a concave shape to change the position of the second cylinder."

In rejection of claim 11, below the examiner uses Brotz. Thus, Applicant's discussion below regarding claim 11, will supplement Applicant's discussion of claim 9, directed to use of a wire.

Claim 10 depends from claim 9 and serves to further distinguish since Johnson neither describes nor suggests: "a member coupled between an upper end portion of the second member

and the wire to transfer a force generated by the wire to the second member." The examiner states that "Regarding claims 10, 12 and 68, it can be seen in Figures 5 and 6 of Johnson that a member is coupled between the actuator and the upper end portion of the second member."

Applicant disagrees in Figures 5 and 6, the member 29 is coupled between the second member and the bi-stable latch mechanism 94, which as disclosed by Johnson, is not the actuators. Thus, Johnson does not disclose a member to transfer a force generated by the wire to the second member.

Claim 11 depends from claim 6 and serves to further distinguish since Johnson neither describes nor suggests that: "the actuator is a ribbon with the ribbon changing between a convex and a concave shape to change the position of the second cylinder."

In rejection of claim 11, the examiner states:

As for claims 11, 13, 69 and 70, Johnson discloses the claimed invention except for the shape memory alloy actuator being in the shape of a ribbon instead of a wire. It would have been an obvious matter of design choice to use a ribbon or a wire, since such a modification would have involved a mere change in the shape of the component. A change in shape is generally recognized as being within the level of ordinary skill in the art. MPEP 2144.04 (IV B)

Johnson fails to teach a the mechanism of the instantly claimed invention, specifically, a member made of a shape memory alloy responsive to current which changes from concave to convex, which in turn moves the members in relation to one another.

In Figures 5 and 6 of Johnson, it is seen that two components go into a mechanism that moves the two members in relation to one another. The first, an actuator mechanism (29), contains a shape memory alloy (column 3 lines 55-67). The second is a latch mechanism (94) that changes from concave to convex in shape, depending on how the members are situated relative to one another.

Brotz teaches a memory metal actuator that may be concave or convex in shape depending on the current applied to it (abstract, Figures 3 and 4).

It would be desirable to replace the latch and actuator mechanism of Johnson with the actuator of Brotz since the actuator of Brotz would solve the same problem of Johnson, to open or close the members in relation to each other, since it would eliminate the need for both the latch and the actuator mechanism of Johnson, making production of the cell simpler since fewer parts would be needed.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the latch and actuator mechanism of Johnson with the actuator of Brotz, making production of the cell simpler since fewer parts would be needed.

The examiner acknowledges that Johnson fails to teach "a the (sic) mechanism of the instantly claimed invention, specifically a member made of a shape memory alloy responsive to current which changes from concave to convex, which in turn moves the members in relation to one another." Applicant agrees with this position.

In addition, Applicant contends that Johnson also fails to teach "a member whose shape deforms ... to move the first one of the ... members such that ..., the member has a first shape that allows air to pass through the opening ... and the member has a second shape that ... inhibit(s) air from passing through the opening

As the examiner also recognizes, Johnson discloses a very complicated scheme to provide the air valve. According to the examiner, Johnson requires: "... two components go into a mechanism that moves the two members in relation to one another. The first, an actuator mechanism (29), contains a shape memory alloy (column 3 lines 55-67). The second is a latch mechanism (94) that changes from concave to convex in shape, depending on how the members are situated relative to one another."

The mechanism of Johnson is even more complicated than the examiner acknowledges. For example, Johnson describes FIGS. 5 and 6 as "incorporating the valve sleeve subassembly of FIG 1." That sub-assembly includes the actuators 32 and 34. Thus, as can be more readily seen in Figures 7-10, item 29 is not a single item as the examiner seems to imply, but rather includes several items such as several transistors, the actuators, two contacts, wiring, and so forth.

Applicant contends that combination of Johnson with Brotz is an improper application of hindsight re-construction, since the Johnson mechanism, is so fundamentally different from that claimed and described by Applicant. Johnson does not offer any guidance to one of ordinary skill how to make to proposed substitution and the examiner also offers no such guidance.

Claim 12 depends from claim 11 and serves to further distinguish since Johnson neither describes nor suggests "a member coupled between an upper end portion of the second member and the ribbon to transfer a force generated by the ribbon to the second member.

Claim 13 is allowable for analogous reasons as in claim 1.

Claim 51, as amended, is allowable over Johnson, since Johnson neither describes nor suggests ... passing current through a member to move from a first position to a second position ... with the second position providing the at least one hole in the first cylindrical member in registration with at least a second hole in a second cylindrical member and when current is not drawn from the battery the member causes the first cylindrical member to return to the first position

This arrangement is neither described by nor suggested by Johnson. Johnson does not suggest a member that provides the at least one hole in each cylindrical member in and out of registration.

The examiner has not offered any reasoning why and how one of ordinary skill in this art would be motivated to modify Johnson. Absent such reasoning it is submitted that the examiner's argument is insufficient and improper and cannot sustain this obviousness rejection.

Claim 59 is allowable for analogous reasons as those in claim 1, since Johnson neither describes nor suggests ... a member coupled to one of the first and second cylindrical members to move the one of the first and second cylindrical members ... to allow air to pass into the battery and to move the one of the first and second cylindrical members ... when current is not drawn from the battery ... to inhibit air to pass into the battery.

Claim 83 is allowable over Johnson, since Johnson neither describes nor suggests ... passing current through a member to move a first member mechanically coupled to the first member relative to a second member ... to permit air to flow through the hole ... and when current is not flowing through the member, the member causes the first member to move inhibiting air from flowing through the hole into the battery.

It is believed that all the rejections and/or objections raised by the examiner have been addressed.

In view of the foregoing, applicant respectfully submits that the application is in condition for allowance and such action is respectfully requested at the examiner's earliest convenience.

All of the dependent claims are patentable for at least the reasons for which the claims on which they depend are patentable.

Canceled claims, if any, have been canceled without prejudice or disclaimer.

Any circumstance in which the applicant has (a) addressed certain comments of the examiner does not mean that the applicant concedes other comments of the examiner, (b) made arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims, or (c) amended or canceled a claim does not mean that the applicant concedes any of the examiner's positions with respect to that claim or other claims.


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Please apply any charges or credits to deposit account no. 06-1050.

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